

What is claimed is:

1 1. A biocompatible radiation shield for use with a radiation applicator system for a radiation
2 source, said radiation applicator system including an applicator head defining a surface having a
3 predefined shape and surface contour, said radiation shield comprising:

4 a substantially thin, biocompatible material, adapted to conform to the shape of at least a
5 portion of the surface contour of said applicator head.

1 2. A biocompatible radiation shield according to claim 1 wherein said biocompatible
2 material includes at least one radiation blocking or absorbing material chosen from the group
3 including tungsten, gold, platinum, rhodium, iridium, tantalum and barium oxide.

1 3. A biocompatible radiation shield according to claim 1 wherein said biocompatible
2 material includes at least one material chosen from the group including urethane, silicone
3 polyamides, and polystyrenes.

1 4. A biocompatible radiation shield according to claim 1 wherein at least a portion of said
2 biocompatible material is adapted to be coupled to said applicator head.

1 5. A biocompatible radiation shield according to claim 1, wherein the biocompatible
2 radiation shield is formed from a tungsten filled urethane material including approximately 60 to
3 90 percent tungsten by weight.

6. A biocompatible radiation shield according to claim 5, wherein the biocompatible radiation shield is formed from a tungsten filled urethane material including approximately 80 percent tungsten by weight.

7. A radiation applicator system for use with a radiation source for facilitating the application of a dose of radiation to a volume, said radiation applicator system comprising:

- A) an applicator, substantially encasing a radiating probe of said radiation source, said applicator including:
 - i) a shank having a proximate end and a distal end; and
 - ii) a head secured to said shank distal end and defining a surface for engaging said area to receive said dose of radiation; and
- B) an adapter, including:
 - i) a first coupler suited for mated engagement with said shank proximate end; and
 - ii) a second coupler suited for mated engagement with said radiation source; and
- C) a biocompatible radiation shield coupled to at least a portion of said head.

8. A radiation applicator system according to claim 7 wherein:
said radiation source includes a housing having an elongated probe extending from said housing and said probe is adapted for producing predefined dose profiles of radiation at a distal

4 end of said probe; and

5 said head is adapted for receiving said distal end of said probe whereby radiation

6 produced by said probe can be applied to an area adjacent said surface of said head.

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1 9. A radiation applicator system according to claim 7 wherein said applicator head defines a
2 substantially spherical surface and said biocompatible radiation shield is formed in the shape of
3 at least a portion of said substantially spherical surface.

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1 10. A radiation applicator system according to claim 7 wherein said applicator head defines a
2 substantially ellipsoidal surface and said biocompatible radiation shield is formed in the shape of
3 at least a portion of said substantially ellipsoidal surface.

1 11. A radiation applicator system according to claim 7 wherein said applicator head defines a
2 substantially cylindrical surface and said biocompatible radiation shield is formed in the shape
3 of at least a portion of said substantially cylindrical surface.

1 12. A radiation applicator system according to claim 7 further comprising a low energy filter,
2 coupled to said distal end of the radiation applicator, for attenuating low energy radiation emitted
3 from said probe.

1 13. A radiation applicator system according to claim 7 wherein said shank includes a

fastening element adapted for fastening said applicator to said radiation source at first predefined position with respect to said radiation source.

14. A radiation applicator system according to claim 7 wherein the biocompatible radiation shield is formed from a tungsten filled urethane material including approximately 60 to 90 percent tungsten by weight.

15. A kit for applying radiation to a volume, said kit comprising:
a radiation source adapted for producing a predefined radiation dose profile;
a plurality of applicator systems and a corresponding plurality of biocompatible radiation shields, each of said applicator systems including:

A) an applicator, substantially encasing a radiating probe of said radiation source, said applicator including:

i) a shank having a proximate end and a distal end; and
ii) a head secured to said shank distal end and defining a surface for engaging said area to receive said dose of radiation; and

B) an adapter, including:

i) a first coupler suited for mated engagement with said shank proximate end; and
ii) a second coupler suited for mated engagement with said radiation source;
and

C) a biocompatible radiation shield coupled to at least a portion of said head.

1 16. A kit according to claim 15 wherein the applicator head of at least one of the plurality of
2 applicator systems is different in size or shape than the applicator head of at least one of the other
3 applicator systems from the plurality of applicator systems.

1 17. A kit according to claim 15 wherein at least one of the plurality of radiation shields is
2 different in size or shape than at least one of the other radiation shields.

1 18. A kit according to claim 15 wherein the applicator head of each of the plurality of
2 applicator systems is different in size or shape than the applicator head of each of the other
3 applicator systems.

1 19. A kit according to claim 15 wherein each of the plurality of radiation shields is different
2 in size or shape than the other radiation shields.

1 20. A kit according to claim 15 wherein at least one of said biocompatible radiation shields
2 includes at least one radiation blocking or absorbing material chosen from the group including
3 tungsten, gold, platinum, rhodium, iridium, tantalum, and barium oxide.